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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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CHICAGO, IL 60604

EXAMINER

LEO, LEONARD R

ART UNIT	PAPER NUMBER
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3743

DATE MAILED: 02/25/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.  
08/737,042

Applicant(s)

Heed

Examiner  
Leonard R. Leo

Art Unit  
3743



-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136 (a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on Dec 2, 2002
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 5 and 7-11 is/are pending in the application.
- 4a) Of the above, claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5 and 7-11 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claims \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some\* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\*See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. § 119(e).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgement is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s). \_\_\_\_\_ 6) ☐ Other:

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## **DETAILED ACTION**

### ***Continued Examination Under 37 CFR 1.114***

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on December 2, 2002 has been entered.

Claims 5 and 7-11 are pending.

### ***Drawings***

The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "ridges and channels being arranged at an angle greater than 45 degrees with respect to a line arranged in a direction along the lengthwise extent" in claim 5 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 5 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over ACV (SU 800,500) in view of Usher.

ACV discloses a recuperative heat exchanger comprising a casing having inlet and outlet ports 2-5; a heat transfer package having a plurality of connected rectangular planar elements with a corrugated pattern extending the entire length and width thereof, the planar elements being folded in an accordion-like manner along fold lines 7; but does not disclose corrugations greater than 45 degrees with respect to the longitudinal flow direction.

Usher discloses a heat exchanger for 2 fluids comprising a plurality of rectangular planar elements (Figures 1-4); wherein the angle of the ridges and channels are 30 degrees with respect to the width of the plate (i.e. 60 degrees with respect to the length of the plate) for the purpose of achieving optimal heat exchange (page 3, lines 31-36).

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in ACV corrugations extending at an angle more than 45 degrees with respect to the net flow path for the purpose of achieving optimal heat exchange as recognized by Usher.

Claims 7-8 and 10-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over ACV in view of Usher as applied to claims 5 and 9 above, and further in view of Hultgren.

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The combined teachings of ACV and Usher lacks top and bottom end covering elements.

Hultgren discloses a heat exchanger comprising a casing 2 defined by top and bottom ends 3 and lengthwise 5 and widthwise 4 sidewalls having inlet and outlet ports 7-10; a heat transfer package 11 (20) having a plurality of connected rectangular planar elements 24 with corrugations 17, the planar elements being folded in an accordion-like manner; and top and bottom end covering elements 13 (Figure 1, column 3, line 67 to column 4, line 2) for the purpose of ease of assembly and manufacture.

It would have been obvious at the time the invention was made to a person having ordinary skill in the art to employ in ACV top and bottom end covering elements for the purpose of ease of assembly and manufacture as recognized by Hultgren.

***Response to Arguments***

The Examiner appreciates applicant's offer to provide an English translation of ACV (SU 800500). However, the copy was not provided or has been separated from the application file. In light of the abstract and drawings, ACV is believed to disclose a heat exchanger of similar structure as claimed by applicant. The Examiner agrees that ACV does not disclose the specific angle of the ridges and channels, as stated in the previous Office actions.

In the prosecution history of the instant application, the angle of the ridges and channels appears to be the novelty.

Claim 3, as originally filed, recited an angle of *less than 45 degrees*.

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Claim 5, as filed on 12/12/1997, recited an angle of *at least 45 degrees*. As amended on 4/23/1999, claim 5 recited *no more than 45 degrees*. As amended on 4/19/2000 and maintained, claim 5 recites *more than 45 degrees*.

In each and every rejection, the Examiner has applied a reference to teach the claimed angle of the ridges and channels. In response, applicant has merely amended the angle to merely overcome the prior art. It is clear that almost any angle may be employed as a matter of design choice and preference.

During the first lifetimes of claim 5, the secondary reference of Usher taught to one of ordinary skill in the art to employ an angle of 60 degrees for the purpose of improving heat exchange. To this extent, the Examiner has resurrected Usher to meet a claim limitation which was previously presented. Applicant can expect previously applied prior art to surface, when previously amended or cancelled limitations are presented anew.

The Examiner agrees that Hultgren does not disclose a corrugation angle of more than 45 degrees with respect to the longitudinal flow direction. However, Hultgren does meet the limitations of claims 7-8 and 10-11.

The Examiner appreciates the problem sought to be solved by the instant invention, i.e. balanced flow distribution. However, the similar structure of the combination of references is believed to function in a manner similar to applicant's instant invention as claimed, and will inherently solve applicant's same problems.

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*Conclusion*

Any inquiry of a general nature, relating to the status of this application or clerical nature (i.e. missing or incomplete references, missing or incomplete Office actions or forms) should be directed to the Technology Center 3700 Customer Service whose telephone number is (703) 306-5648.

Any inquiry concerning this Office action should be directed to Leonard R. Leo whose telephone number is (703) 308-2611.

  
LEONARD R. LEO  
PRIMARY EXAMINER  
ART UNIT 3743

February 22, 2003